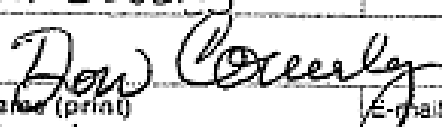





**Qwest Foundation for Education
Competitive Sub-grant Proposal Assurance Sheet**

Project Title: Science & Math Assistance Center Amount of Request: \$ 9503.24
 Name of Certificated Teacher (or "lead teacher" if more than one): Heidi Pluska
 Name of School currently teaching at: Boise High School
 District Name: Boise District Number: 854-4000
 Total number of teachers involved (if more than one): 3
 Approximate number of students impacted: 1400 Grade level(s) impacted: 9-12
 Content area(s) impacted: Science & Math

I certify that if I receive a Qwest Foundation for Education Grant –

- I agree to create a 5-minute video highlighting my project for the purposes of sharing best practices with other Idaho K-12 teachers.
- I agree to do one presentation on my project to other Idaho K-12 teachers before October 31, 2011.
- I agree to submit an electronic report to the Idaho State Department of Education before October 31, 2011.

Superintendent Name (print) <u>Dr. Don Coberly</u>	E-mail <u>don.coberly@boiseschools.org</u>	Telephone <u>854-4123</u>
Signature 		
Principal Name (print) <u>Ken Anderson</u>	E-mail <u>ken.anderson@boiseschools.org</u>	Telephone <u>854-4270</u>
Signature 		
Teacher or Lead Teacher Name (print) <u>Heidi Pluska</u>	E-mail <u>heidi.Pluska@boiseschools.org</u>	Telephone <u>854-4337</u>
Signature 		
Technology Director (print) <u>Steve Tyree</u>	E-mail <u>steve.tyree@boiseschools.org</u>	Telephone <u>854-4107</u>
Signature 		

Submit one digital copy (PDF format) of your proposal by November 19, 2010 via e-mail to:
 Jimmy Takata
jtakata@sde.idaho.gov
 208.332.6937

*Only one PDF file per teacher applicant will be accepted (this includes the Assurance Sheet). Faxes will not be accepted.

Abstract

Summary: In 2008 staff at Boise High School spearheaded the development and implementation of the Math Assistance Center (MAC) as a means to provide students at Boise High School consistent and affordable access to trained math tutors. Meanwhile, other teachers at Boise High School collaborated to develop and implement Zofia, a software system reflecting their vision of an online curriculum delivery system consisting of three main components: (1) An Exam Lab, where teachers can post and share exam questions and students can test their own knowledge and understanding of curricular content; (2) A file management system that allows for the placement of course materials on the Internet for student, parent, and teacher access; and (3) A grading and correspondence program that compiles data gleaned from online exams and computes grades and statistics so that students, teachers, and parents alike receive immediate feedback regarding mastery of course content. While the success of each of these programs speaks volumes for the ingenuity and passion of the teachers at Boise High School, their energies and their students would be better served if these programs were united. A portable computer lab would not only enable the coalescence of these programs, it would also facilitate the incorporation of technologies which have been shown to improve student learning. Our vision, as science and math faculty, is to (1) expand the Math Assistance Center to also include assistance for Science and to (2) integrate technologies which have been shown to impact student learning in positive ways. Science and math students alike would benefit as they would have access to software programs emphasizing features associated with learning enhancement. Furthermore, tutors and teachers would be able to better focus their efforts as information about learning proficiency is immediately communicated.

Problem: The impacts of online formative assessments on student achievement are well documented both in and out of the classroom. In a study conducted during the 2005-2006 school year, I was able to demonstrate that carefully crafted assessments not only serve to challenge students' misunderstandings of concepts but also offer teachers and tutors knowledge essential for guiding student learning. Since the implementation of Zofia at Boise High School, an item bank for Chemistry, consisting of over 2500 questions has been developed; an item bank of more than 3000 questions has been developed for math. These item banks have allowed teachers to implement assessments which integrate dynamic interactive content, and communicate feedback on areas of weakness. Unfortunately, the majority of students are left to take these assessments during their own time either at home or in the library. Because there are no computers available at the Assistance Center, students, teachers, and tutors fail to realize the full potential of this innovative technology. While I have offered tutoring sessions in my classroom during lunches, I have been limited by a lack of computers and time. If granted the funds to purchase a portable computer lab for the Assistance Center, students will be able to consistently use the technology to engage in assessments that communicate information about their understandings. Using this knowledge, teachers and tutors will be better equipped for guiding students through the learning process.

Project Details: I am requesting \$9,503.24 to facilitate the expansion of the Math Assistance Center to include Science and incorporate technologies that have been shown to enhance student achievement. To this end, the funds will be used to purchase eight laptops along with eight copies of MS Office XP Pro, a portable charging cart, and server space to host Zofia. Additionally, the funds will be used to install eight Internet drops. The assistance center will be available to all math and science students (over 1400 students) and will be used to facilitate tutoring via online assessments. This project will serve as a prototype for fostering student achievement in Science and Math through teacher collaboration, peer tutoring, and technology.

Current Innovation

Zofia: Technology is a major force in the educational process at Boise High School and has provoked fundamental changes in learning environments in many classrooms. New technologies have enabled teachers to enliven their lectures with vivid, dynamic examples. They have also made it possible to instantly assess what students are learning at very fine levels of detail, even from distant locations.

Four years ago, with the encouragement and input of other teachers, I developed Zofia, a sophisticated curriculum delivery system, which has been shown to enhance student learning significantly¹. Using the program, students take assessments which integrate dynamic interactive content that pencil and paper tests cannot offer. For example, many of the chemistry assessments incorporate interactive flash videos that capture students' interest as they move virtual atoms to build molecules or rearrange virtual laboratory equipment to design an experiment. The math teachers can post assessments for their students that incorporate symbols, such as integrals and derivatives, that other assessment software are incapable of rendering. As students submit assessments via Zofia, information about areas of strengths and weaknesses are immediately communicated to teachers, students, and parents. As this information is stored within Zofia, subsequent assessments are differentiated for that student: questions the student answered correctly are not displayed again; they are replaced with new questions that reflect the students' areas of weaknesses.

Zofia serves to enhance student learning, enables easy access to course materials, and provides grade reports which are dynamically updated with each submitted assessment. Using the file manager, teachers can post materials that students, parents, and tutors can access through individual logins. Likewise, students can upload assignments for teachers. Dynamically updated grade reports allow for accurate, immediate reviews of both individual and group learning trends.

Math Assistance Center (MAC): Two years ago, Susan Stauffer, a mathematics teacher at Boise High School, created a novel program that provides a place where students can go for two hours after school three days (Monday, Tuesday, and Thursday) of the week to do homework and get quality assistance in mathematics free of charge. Assistance is provided by a math teacher supervisor and trained tutors who specialize in certain topics. For example, one tutor may excel in Advanced Placement Statistics and Algebra II, while another specializes in Advanced Placement Calculus, Math Analysis, and Geometry. Using grant money leveraged through the Boise Schools Foundation and the Brave Parents, supervisors and student tutors are provided incentives through business-discounted certificates.

A dedicated mathematics department, student tutors, and adult community volunteers have helped ensure the success of the MAC. During the 2009-2010 school year, 2,110 student entries were logged in the MAC sign-up sheets for a total of 2,453 hours. According to a randomized survey conducted during the spring of 2010, 100% of the respondents who attended the MAC agreed or strongly agreed that the MAC was a program that should be continued at Boise High School. 67% of the respondents agreed or strongly agreed that the MAC helped them be more successful in their math classes. Of the tutors who were surveyed, 74% either agreed or strongly agreed that their experiences at the MAC helped them to become better at helping their peers with math.

It is clear from these results that the MAC has had a positive impact on student learning at Boise High School. Other results from the survey indicated that the students feel very welcome at the MAC and perceive the tutors as both knowledgeable and helpful about the topics.

¹ In a study conducted during the 2005-2006 school year, experimental scores on the District's End of Course Exam and on the American Chemical Society's General Chemistry Exam were significantly higher than those of the control group.

Project Narrative

According to the National Research Council, formative assessments, which measure clear learning goals and provide ongoing feedback to the student and teacher about the nature of what has been learned, can help ensure the incorporation of instruction on a learner needed basis. These insights support the growing belief amongst educators that the integration of formative assessments can promote the acquisition of valued outcomes. In order for formative assessments to be effective however, several obstacles must be overcome. First, teachers must have access to questions which have been shown to probe for valuable outcomes. Next, teachers must have time to grade these questions and provide feedback to the students. Finally, teachers must be able to quickly evaluate individual and group learning trends so that they can adjust their instruction in a timely manner.

Zofia, a software system, development by me in conjunction with faculty in the Boise School District, has made it possible to overcome many of these obstacles. Teachers now have easy access to assessment items that are correlated to district, state, and national standards. Zofia has made it feasible for teachers to easily implement assessments which incorporate these items. Finally, Zofia has made it possible to continuously collect and communicate the information necessary for guiding students through the learning process. But, despite the obstacles that Zofia has served to circumvent, the time required to guide individual students through the learning process remains beyond the scope of a typical teacher.

The unique needs of all students and the inability of teachers to meet those needs is a pervasive problem in education. Two years ago Susan Stauffer, a math teacher at Boise High School, confronted this obstacle when she created the Math Assistance Center (MAC). Since its implementation, the MAC has proven extremely successful at meeting the needs of students who have questions about problems on a worksheet or in a textbook. However, as more teachers increasingly turn to online homework as a means to assess student understanding, the ability of the MAC to meet the needs of students is diminished because there are no computers available.

A portable computer lab will bridge the gap between the valuable information communicated by online assessments and the human interactions required of guiding students through the learning process. As students submit assessments online, information about their strengths and weaknesses is immediately communicated. With this information, tutors will be able to more effectively guide students through the learning process, thereby meeting the unique needs of the student. Additionally, as teachers realize that students have access to computers in the assistance center they will be more inclined to integrate online assessments into their own instruction.²

A portable computer lab will also ensure that tutors and students have access to course materials via Zofia's file manager, and other software that teachers commonly integrate into their curriculums. Each year, for example, I use ISIS Draw, a molecular modeling software, to teach the concept of molecular geometry. Geometry teachers at Boise High School frequently use Geometer's Sketchpad. My forensic science students use Crime CAD to recreate crime scenes and FACES for creating composite sketches. Boise High School has site licenses for each of these valuable software and more, but they remain under utilized because student access is limited to school hours.

Project Team Members: Susan Stauffer, Roanna Barclay, and I will be responsible for implementing this project. The math and science faculty will also serve to implement this project as they rotate supervisory shifts in the assistance center. My background in technology and how it applies to education is extensive. I have been involved in website design since 1996. Ten years ago, while completing my Masters in Curriculum and Instruction, I taught technology courses at Boise State University and also provided technology support to faculty. My thesis research project, which I completed in 2005, was an inquiry into how to effectively incorporate online formative assessments into the Chemistry curriculum. Eight years ago, I began developing online curriculum software and in 2006, with a \$12,000 grant from the Boise School District, developed Zofia. Since 2006, I have served as the webmaster/developer for Zofia and have

² Teachers frequently cite lack of student computer availability as a major reason for not incorporating online assessments.

offered numerous trainings for teachers on how to effectively incorporate online assessments into the classroom. I will be responsible for the implementation of the portable computer lab along with the installation of the required Internet drops. I will also provide teacher trainings on how to effectively incorporate formative online assessments. I will complete the grant follow-up paperwork, and will create the video for the presentation in October 2011. Susan Stauffer has taught mathematics (AP Statistics and Algebra II) for 10 years. Ms. Stauffer spearheaded the MAC two years ago and has since served as the program director of this successful program. Roanna Barclay has taught mathematics (AP AB & BC calculus and accelerated algebra II) for 14 years. She has assisted with the MAC for two years and also has trained tutors alongside Ms. Stauffer. Ms. Barclay is currently co-director of the MAC. Ms. Stauffer, Ms. Barclay, and I will work to coordinate assistance center staffing and will help provide training to tutors and supervisors.

Feasibility: This project is feasible. The Boise School District has several existing portable computer labs. The district technology center has outfitted these labs and provides the necessary support for their ongoing use. The expertise shared between Ms. Stauffer and me is complementary. Ms. Stauffer has the expertise of organizing, implementing and sustaining the assistance center, while I have the background required of implementing the technology. The staff at Boise High School is committed to incorporating new technologies which have been shown to bring greater efficiency to the teaching and learning process. The staff is also committed to supervising the assistance center as needed. The school administration is committed to the project and will ensure that the support is provided for the installation and maintenance of the lab.

Sustainability: This project seeks to incorporate two well-established programs, both of which have been shown to successfully enhance student learning. As previously cited, 100% of those attending the MAC indicated that they agreed or strongly agreed that the MAC is a program that should be continued at Boise High School. Given this fact, the high attendance data from previous years, and the overwhelming support of parents, teachers, and administrators, it is highly anticipated that this program will continue for years to come. To help further ensure the sustainability of the assistance center, the Brave Parents have even committed to setting aside \$1,500 per year for tutor and supervisor incentives. Zofia has been in use at Boise High School for five years. Because this software was developed "in house," the cost to maintain the software is negligible. I will provide the necessary training to teachers, tutors, and supervisors to ensure its continued use at the assistance center.

School/District Support: Boise High School and the Boise School District support this project fully. In 2008, Susan Stauffer was granted \$7,400 from the Boise Schools Education Foundation to initiate the MAC. These startup funds were used to purchase calculators, cabinets, and incentives for tutors and supervisors. In 2006, the Boise School District granted me \$12,000 to develop Zofia. Then, in 2008, the Boise School District granted me a half-year sabbatical to expand upon Zofia. The total cost to the Boise School District on these two projects were in excess of \$40,000. It is clear from these numbers that the Boise School District is highly supportive of these projects and I have been encouraged to seek funding from the Qwest foundation so that they may be combined. Our Principal, Ken Anderson, is also very supportive. Mr. Anderson's longtime committed to creating a climate that promotes a culture of excellence is evident in the character and achievement that Boise High School boasts. Programs like the assistance center, because it utilizes peer tutors to ensure academic success for all students, serve to foster this climate.

Anticipated Outcomes/Impacts: The impacts of both the MAC and online formative assessments are well documented. During the 2009-2010 school year, 2,110 student entries logged 2,453 hours of MAC attendance. The majority of these students agreed that the MAC helped them to be more successful in their math classes. During the 2005-2006 school year, a study which compared experimental and control group scores on the District's End of Course Exam and on the American Chemical Society's General Exam strongly supported the use of

online formative assessments. Another interesting finding in this same study was that students of all abilities seemed to benefit equally well. For example, students who received Ds first semester appeared to learn at the same rate as those receiving As. These results suggest that when provided with enough opportunities and support, *all* students can benefit from online formative assessments. Given these data, it is anticipated that student learning will be enhanced significantly across all levels. It is also anticipated that because we are incorporating assistance for science that the number of logged entries should increase significantly. Utilizing computers to deliver online formative assessments that communicate immediate feedback to students and tutors will ensure the incorporation of instruction on a learner-needed basis. As tutors guide students through online assessments that are closely aligned with district, state, and national standards it is anticipated that student achievement on District End of Course Exams, Idaho State Achievement Tests, and Advance Placement Exams will also improve.

Additionally, it is anticipated that as teachers realize computers are available to students at the assistance center, they will be more likely to incorporate facets of technology that extend beyond traditional assessments. For example, I could require a student that was absent when the class did a molecular modeling assignment with ISIS draw to complete this at the assistance center. Another teacher could recommend an English Language learner to complete a power point presentation with the help of a native English-speaking tutor. It is anticipated that although we are requesting computers so that we may enhance student learning of math and science, eventually these computers will be seen as resources for all subject areas.

Finally, because dedicated student tutors comprise the core of the assistance center, it is anticipated that program will serve to promote the culture of excellence well established at Boise High School. Student tutors, by helping their peers succeed, will come to realize their greater role in the Boise High School community. Tutees will come to value others for the contributions they offer.

Project Scope and Sequence

Goals and Objectives: The portable computer lab will serve to accomplish two major goals: (1) expand the Math Assistance Center to also include assistance for Science and (2) integrate technologies which have been shown to impact student learning in positive ways. The first objective towards accomplishing these goals would be to ensure the successful installation of the cart and laptops and to upgrade the cafeteria, where the assistance center sessions are held, to accommodate online accessibility of the laptops. This will be accomplished during the spring semester so that beta testing of the lab can be completed prior to the 2011-2012 school year. The second objective is to plan and provide training to tutors at the assistance center. Training sessions will be conducted in September 2011. In addition to outlining program expectations and providing training in tutoring and communication skills, the sessions will include a mock tutoring session for the would-be tutors to practice giving assistance while keeping the student accountable for learning. Some topics also to be addressed include effectively communicating with English Language Learners and other students with special needs. The third and final objective would be to train teachers on how to effectively incorporate online assessments into their classrooms. Training sessions for teachers will take place August 2011 before school begins. Although many teachers already incorporate online assessments in their classrooms, additional trainings will help maximize the benefits the assistance center offers.

Milestones:

Jan-Mar 2011: Purchase laptops, cart, and tables. Upgrade cafeteria to include 8 drops for online access. Install lab and beta test.

Mar-May 2011: My students will begin utilizing the lab. Technology glitches will be troubleshooted during this time.

Jun-Aug 2011: Edit applications for tutors and evaluations questionnaires. Contact a few popular businesses to line up incentive options. Notify parents at registration and in the school newsletter and weekly school email about the assistance center. Provide training sessions for teachers on how to effectively integrate online assessments into their classrooms.

Sep 2011: Application process and tutor selection. Tutor training session. Schedule tutors and supervisors. Assistance center begins September 19 and offers 92 sessions on most Mondays, Tuesdays, and Thursdays through May 25, 2012. Contact businesses identified by tutors and supervisors and try to get discounts to leverage dollars and provide incentives. Prepare video and presentation highlighting the project.

Oct 2011: Present project to other K-12 teachers. Prepare and submit electronic report to the Idaho State Department of Education.

Jan 2012: Compare progress of non-attendees with regular attendees who started Nov. 1

Mar 2012: Survey random sample of general population for perceptions of the program and suggestions.

Jun 2012: Compare progress of non-attendees with regular attendees who started around April 1.

Evaluation Strategy: Attendee success will be measured by comparing semester grades and End of Course Exam scores of students in classes for which they received tutoring for at least nine sessions to students of similar ability who did not receive tutoring. Additionally, improvement in grades of new attendees who attend at least twice a week for three consecutive weeks will be tracked. Data from the surveys will be one measure of success for gains made by our tutors. If a tutor maintains excellent ratings, that will be an indicator of success. The overall success of the program will be evaluated using parent, student, teacher, supervisor, and student tutors surveys. The survey will measure perceptions concerning the effect of the assistance center on participants' grades, confidence, and understanding, along with the program aspects such as quality of assistance given by tutors and teachers and time of day the tutoring was available.

Budget Narrative

With the project funds, Boise High School will purchase 8 Lenovo laptop computers, 8 copies of MS Office XP Pro, and a mobile charging station. The funds will also be used to install 8 internet drops. Additionally, funds will be applied to cover hosting costs for Zofia.

Lenovo laptop computers. The Lenovo laptop computers were recommended by the Boise School District Technology department. The Lenovo laptop is used throughout the school district so the technology team is familiar with this machine and is therefore able to service and reimage these machines with the district network and required applications as needed. The Lenovo features an Intel Core 2.13 gh processor, a 160 gb hard drive, and a standard 3 year warranty. The processor and hard drive capabilities will ensure the necessary capacity required of additional software the math and science teachers incorporate into their curriculums.

Software. The MS Office XP Pro license does not come preinstalled and needs to be purchased separately. The license will be purchased through the district at a significantly discounted rate.

Balt 10 Slot Mobile Mobile Laptop Charging station. We will order this station from our district's vendor list. This mobile cart allows easy transport of laptops from room to room as needed. The station holds 10 laptops and features built-in UL/CSA-approved electrical outlets for each laptop compartment making charging simple. The unit also includes locking doors to prevent theft and tampering.

Hosting Space. Server space for Zofia is provided through Website Source. Zofia is hosted on a virtual private server (VPS). The 100 GB of disk space provided through the hosting plan allows us to harness the performance, security, and control of a dedicated server for a fraction of the cost of a dedicated hosting plan. The application and feature rich VPS includes PHP, MySQL, and JAVA support, comes with easy-to-use Web-based administrative features and full root-level configuration and customization. Zofia requires all of these features.

Internet drops. Internet drops will be required for each computer. The Boise District Technology department will install these drops. This will ensure the most economical price and serviceability.

Budget Sheet

Materials and Supplies	Quantity	Price per unit	Total
Lenovo laptop computers	8	758.00	6064.00
MS Office XP Pro license	8	51.28	410.24
Balt 10 Slot Mobile Mobile Laptop Charging station	1	309.00	309.00
Internet drops	8	250.00	2000.00
Web hosting	12	60.00	720.00
Grand Total			9503.24